

**Mechanical Engineering MECHENG 4P03A/B**

**Composite Laboratory**

Faculty of Engineering – McMaster University – Undergraduate Studies

Fall/Winter 2020/21

**Course Outline**

**Calendar/Course Description**

The Composite Laboratory course is designed to give students an appreciation of experimental techniques used in mechanical engineering. The experiments demonstrate how useful engineering information can be extracted from a series of well-planned tests.

**Pre-Requisites and Anti-Requisites**

Prerequisite(s): Registration in any Mechanical Engineering program and MECH ENG 3M03 (or 3M02)

Antirequisite(s): MECHENG 4P02

**Instructor Office Hours and Contact Information**

Mr. John Colenbrander, P.Eng, M.A.Sc.  
JHE 207  
colenbjw@mcmaster.ca  
MS Teams ID: colenbjw

MS Teams-based Office Hours:  
By Appointment  
(*please email or PM on MS Teams to arrange*)

**Teaching Assistant Office Hours and Contact Information**

Laboratory TAs are assigned to each lab; grading TAs are also associated with the course. TA names and contact information are provided on Avenue.

TA Office Hours: During Laboratory sessions AND during lab hours on opposite weeks. Other times by appointment.

**Course Website/Alternate Methods of Communication**

Course is hosted on Avenue to Learn (<http://avenue.mcmaster.ca/>) under MECHENG 3M03. Please contact the course coordinator immediately by email if you are registered for the course but do not have access to the course on Avenue.

All formal communication regarding course requirements, changes, assignment submissions, etc. will be announced in Avenue. It is assumed that any announcements on Avenue have been received by all students registered in the class.

In addition, MS Teams will be used to deliver the labs synchronously. It is best to install the MS Teams application locally (and test that it is functioning properly) rather than depend on the web-based versions; all McMaster students have access to MS Teams software through Office 365 (See <https://office365.mcmaster.ca/>).

#### Communication with Course Coordinator / TAs:

MS Teams is an excellent format for quick messages, questions or for meeting one-on-one or in small groups, but please use email for any formal direct communication with the instructor or TAs. Please include the course code (i.e. MECHENG 3M03 or MECHENG 4P03) as the first component of the subject line. For example, an email regarding a question about the lab writeup lab might have the subject line “*MECHENG 4P03 – Question about lab writeup*”.

#### **Course Intended Learning Outcomes**

Upon successful completion of the course the students will be expected to have demonstrated the ability to:

1. Understand fundamental experimental techniques in mechanical engineering.
2. Perform and/or observe experiments to extract useful engineering information.
3. Determine important parameters that affect the outcome of an experiment.
4. Analyze experimental data and present in usable form.
5. Reach sound conclusions from well analyzed data.
6. Write-up formal engineering reports.

#### **Materials and Fees**

Required Texts:

- Custom Lab Notes and Manuals, Pre-Lab and Lecture Content located within Avenue.

Materials required for online Laboratory sessions:

- A computer or tablet with MS Teams installed, signed in using the registered students' macid.
- A reliable high-speed internet connection
- Video chat equipment (webcam, headset and/or microphone/speakers) to participate in lab session.

Materials required for Quanser Virtual Labs (Required for 4P03, may be optional for 3M03):

- QLABS Virtual labs run on Windows 10 (64-bit) and requires MATLAB 2019a or later (Campus-Wide Access available for download here: <https://www.mathworks.com/products/matlab/student.html>).
- Download instructions for QLABS Virtual Labs will be made available in Avenue
- Department computer lab workstations will be equipped with this software. See Avenue for remote login procedures, including VPN login.

#### **Course Format and Expectations**

The course is based on the successful completion of ten labs. For each lab, the student must prepare, attend, and engage in the lab, and submit the follow-up assignments. Five labs are scheduled each term and they must be completed within the scheduled terms.

These elements are organized as follows:

- Prelab student preparation – review lab manuals & lab video(s), get perfect on Pre-Lab Quiz
- 1x 3-hr Lab Experiment on MS Teams, every other week (see schedule in Avenue) – 10 Labs total
- 1x 3-hr Tutorial every other week
- 1x Full Lab Report per term (due 2 weeks following lab session) – 2 Full Lab Reports total
- 1x Lab Assignment per lab (due 1 week following lab session) – 10 Lab Assignments total

Minimum Requirements to Pass the Course

1. Attend and complete all the scheduled Lab Experiments on MS Teams (10 labs total)
2. Complete all scheduled Lab Assignments
3. Achieve at least 50% on the Full Lab Reports.

Details describing each of the elements listed above will be provided during an Orientation Lecture (see schedule below, and Avenue for details on accessing the lecture) as well as in documents on Avenue.

<b>Course Schedule</b>
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Date/Week	Topic	Readings
Sept 8 – 14	Orientation Class – during scheduled lab time	See Avenue
Sept 15 – Apr 9	Lab Experiments – during scheduled lab time, every other week (see Schedule in Avenue)	Complete Pre-Lab requirements
Dec 9 – Jan 6	No regularly scheduled labs	n/a

<b>Assessment</b>
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Component	Due Date	Weight
10x Pre-Lab Quizzes	Before each lab	10%
10x Assignments	1 week following labs, midnight	60%
2x Full Lab Reports	2 weeks following labs, midnight	30%
Total		100%

<b>Accreditation Learning Outcomes</b>
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The Learning Outcomes defined in this section are measured for Accreditation purposes only and will not be directly taken into consideration in determining a student's grade in the course.

Graduate Attributes	Learning Outcomes where Attribute is Measured
Knowledge base for Engineering (Indicator 3,4)	1,2,3,4,5
Problem Analysis (Indicator 1,2,3)	2,3,4,5
Investigation (Indicator 1,2,3)	2,3,4,5
Communication Skills (Indicator 1,2,3)	6

For more information on Accreditation, please visit: <https://www.engineerscanada.ca>

<b>Equity, Diversity, and Inclusion</b>
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Every registered student belongs in this course. Diversity of backgrounds and experiences is expected and welcome. You can expect your Instructor to be respectful of this diversity in all aspects of the course, and the same is expected of you.

The Department of Mechanical Engineering is committed to creating an environment in which students of all genders, cultures, ethnicities, races, sexual orientations, abilities, and socioeconomic backgrounds have equal access to education and are welcomed and treated fairly. If you have any concerns regarding inclusion in our Department, in

particular if you or one of your peers is experiencing harassment or discrimination, you are encouraged to contact the Chair, Associate Undergraduate Chair, Academic Advisor or to contact the [Equity and Inclusion Office](#).

### Physical and Mental Health

For a list of McMaster University's resources, please refer to the [Student Wellness Centre](#).

### Academic Integrity

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity. **It is your responsibility to understand what constitutes academic dishonesty.**

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university. For information on the various types of academic dishonesty please refer to the [Academic Integrity Policy](#), located at <https://secretariat.mcmaster.ca/university-policies-procedures-guidelines/>

The following illustrates only three forms of academic dishonesty:

1. plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.
2. improper collaboration in group work.
3. copying or using unauthorized aids in tests and examinations.

### Authenticity / Plagiarism Detection

**Some courses may** use a web-based service (Turnitin.com) to reveal authenticity and ownership of student submitted work. For courses using such software, students will be expected to submit their work electronically either directly to Turnitin.com or via an online learning platform (e.g. A2L, etc.) using plagiarism detection (a service supported by Turnitin.com) so it can be checked for academic dishonesty.

Students who do not wish their work to be submitted through the plagiarism detection software must inform the Instructor before the assignment is due. No penalty will be assigned to a student who does not submit work to the plagiarism detection software. **All submitted work is subject to normal verification that standards of academic integrity have been upheld** (e.g., on-line search, other software, etc.). For more details about McMaster's use of Turnitin.com please go to [www.mcmaster.ca/academicintegrity](http://www.mcmaster.ca/academicintegrity).

### Courses with an On-Line Element

McMaster is committed to an inclusive and respectful community. These principles and expectations extend to online activities including electronic chat groups, video calls and other learning platforms.

**Some courses may** use on-line elements (e.g. e-mail, Avenue to Learn (A2L), LearnLink, web pages, capa, Moodle, ThinkingCap, etc.). Students should be aware that, when they access the electronic components of a course using these elements, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in a course that uses on-line elements will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure, please discuss this with the course instructor.

### Online Proctoring

**Some courses may** use online proctoring software for tests and exams. This software may require students to turn on their video camera, present identification, monitor and record their computer activities, and/or lock/restrict their browser or other applications/software during tests or exams. This software may be required to be installed before the test/exam begins.

### Conduct Expectations

As a McMaster student, you have the right to experience, and the responsibility to demonstrate, respectful and dignified interactions within all of our living, learning and working communities. These expectations are described in the [Code of Student Rights & Responsibilities](#) (the "Code"). All students share the responsibility of maintaining a positive environment for the academic and personal growth of all McMaster community members, **whether in person or online.**

It is essential that students be mindful of their interactions online, as the Code remains in effect in virtual learning environments. The Code applies to any interactions that adversely affect, disrupt, or interfere with reasonable participation in University activities. Student disruptions or behaviours that interfere with university functions on online platforms (e.g. use of Avenue 2 Learn, WebEx or Zoom for delivery), will be taken very seriously and will be investigated. Outcomes may include restriction or removal of the involved students' access to these platforms.

### Academic Accommodation of Students with Disabilities

Students with disabilities who require academic accommodation must contact [Student Accessibility Services](#) (SAS) at 905-525-9140 ext. 28652 or [sas@mcmaster.ca](mailto:sas@mcmaster.ca) to make arrangements with a Program Coordinator. For further information, consult McMaster University's [Academic Accommodation of Students with Disabilities](#) policy.

### Course Policy on Missed Work, Extensions, and Late Penalties

1. It is the students' responsibility to regularly check the course webpage (ex. Avenue to Learn) for updates and announcements related to this course.
2. No student who has not completed the Pre-Lab Quiz and achieved a perfect mark will be permitted to perform the labs. Note: Mark from the first attempt is used in grade calculation; unlimited Quiz attempts are permitted.
3. All lab Assignment submissions are due at midnight, one week following the date of the lab. Full Lab Reports are due at midnight, two weeks following the date of the lab. In both cases, a one-week grace period applies. Please inform the appropriate marking TA if you will be submitting past the grace period. Submissions will not be accepted after December 9, 2020 (Fall / Term 1 Labs) or after April 9, 2021 (Winter / Term 2 Labs) unless arrangements have been made with the Instructor at least 1 week prior..
4. MISSED LABS: Note that you must "attend and complete all the scheduled labs (10 labs total)" as one of the criteria to pass the course. If a student misses a lab or a large portion of it due to technical difficulties (bad internet connection, computer issues, etc), re-scheduling may be possible with the TA. It should be noted that there are very limited make-up opportunities, and the new time may conflict with other courses, so every effort should be made to attend labs as scheduled. Changes to lab schedule and due dates are not recommended. Re-scheduling requests must be made formally, by email to the TA, who will assist in scheduling the make-up time at the next available time slot, and informing the course coordinate of the changes. Abuse of this policy will be investigated. If the re-scheduling is MSAF-related, please follow the procedure in the next session. ALL MISSED LABS MUST BE MADE UP; all five labs must be completed before the end of each semester. Rescheduling more than one lab may put you at risk of not being able to meet this requirement.

### Submission of Request for Relief for Missed Academic Work

In the event of an absence for medical or other reasons, students should review and follow the Academic Regulation in the Undergraduate Calendar “Requests for Relief for Missed Academic Term Work”.

1. Relief for missed academic work worth less than 25% of the final grade resulting from medical or personal situations lasting up to three calendar days:
  - Use the [McMaster Student Absence Form](#) (MSAF) on-line self-reporting tool. No further documentation is required.
  - Students may submit requests for relief using the MSAF once per term.
  - An automated email will be sent to the course instructor, who will determine the appropriate relief. Students must immediately follow up with their instructors. Failure to do so may negate the opportunity for relief.
  - The MSAF cannot be used to meet a religious obligation or to celebrate an important religious holiday.
  - The MSAF cannot be used for academic work that has already been completed attempted.
  - An MSAF applies only to work that is due within the period for which the MSAF applies, i.e. the 3-day period that is specified in the MSAF; however, all work due in that period can be covered by one MSAF.
  - The MSAF cannot be used to apply for relief for any final examination or its equivalent. See *Petitions for Special Consideration* above.
2. For medical or personal situations lasting more than three calendar days, and/or for missed academic work worth 25% or more of the final grade, and/or for any request for relief in a term where the MSAF has been used previously in that term:
  - Students must report to their Faculty Office to discuss their situation and will be required to provide appropriate **supporting documentation**.
  - If warranted, the Faculty Office will approve the absence, and the instructor will determine appropriate relief.

### Academic Accommodation for Religious, Indigenous or Spiritual Observances (RISO)

Students requiring academic accommodation based on religious, indigenous or spiritual observances should follow the procedures set out in the [RISO](#) policy. Students should submit their request to their Faculty Office **normally within 10 working days** of the beginning of term in which they anticipate a need for accommodation or to the Registrar's Office prior to their examinations. Students should also contact their instructors as soon as possible to make alternative arrangements for classes, assignments, and tests.

### Copyright and Recording

Students are advised that lectures, demonstrations, performances, and any other course material provided by an instructor include copyright protected works. The Copyright Act and copyright law protect every original literary, dramatic, musical and artistic work, **including lectures** by University instructors

The recording of lectures, tutorials, or other methods of instruction may occur during a course. Recording may be done by either the instructor for the purpose of authorized distribution, or by a student for the purpose of personal study. Students should be aware that their voice and/or image may be recorded by others during the class. Please speak with the instructor if this is a concern for you.

### Extreme Circumstances

The University reserves the right to change the dates and deadlines for any or all courses in extreme circumstances (e.g., severe weather, labour disruptions, etc.). Changes will be communicated through regular McMaster communication channels, such as McMaster Daily News, A2L and/or McMaster email.